IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

In Re Application of:

Wang *et al.*

Serial No.: 10/729,804

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Confirmation No.: 2268

Group Art Unit: 2451

Examiner: Madamba, Glenford J.

TKHR Ref: 250338-1500
Client Ref: S-296

For: **CLASS-BASED RATE CONTROL USING MULTI-THRESHOLD LEAKY BUCKET**

REPLY BRIEF

Mail Stop Appeal Brief - Patents
Commissioner of Patents and Trademarks
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Sir:

This Reply Brief is timely submitted in response to the Examiner's Answer mailed March 19, 2010. The Grounds of Rejection section on pages 4-25 of the Examiner's Answer appears to generally recapitulate the prior positions taken by the Examiner in the Office Action mailed April 14, 2009. Appellants continue to disagree with the Examiner's positions as to all claim rejections under appeal, and Appellant's Appeal Brief sets forth substantive reasons why the references of record do not properly teach the claimed features. In section 10 beginning on page 26, the Examiner's Answer set forth additional remarks in response to the arguments set forth in Appellants' Appeal Brief. For the most part, the Examiner's clarifying remarks do not appear to change the basis of the rejections set forth earlier in the Office Action. Therefore, rather than restate or reiterate all

of the bases and reasons why Appellants continue to disagree with the Examiner, Appellants re-allege selected positions set forth in the Appeal Brief.

Appellants respectfully maintain that independent claim 1 is patentable over *Carter* in view of *Patel* further in view of *Elwalid*. In rejecting claim 1, the Office Action mailed April 14, 2009 alleges that *Elwalid* discloses the features "wherein a size of the leaky bucket is less than or equal to a size of the associated output buffer" and "based on a current token availability level being within a token availability region specifying transmission suppression of packets of the traffic class." (Office Action dated April 14, 2009, pages 5-6). On page 27 of the Examiner's Answer, the Examiner discusses how *Elwalid* discloses the feature "wherein a size of the leaky bucket is less than or equal to a size of the associated output buffer" and refers to the relationship $B_{DS} \geq B_T - B_{TS}$. Appellant notes that this relationship (defined in col. 11, line 31) was not specifically discussed in the Office Action mailed April 14, 2009. Rather, the Office Action briefly referred to the data buffer size B_{DS} and cited col. 11, lines 29-55 without articulating the basis for how this disclosed relationship corresponds to the feature in claim 1. In this regard, Appellants respectfully submits that the remarks set forth by the Examiner in the Response to Arguments section amount to a new ground of rejection.

Although the new ground of rejection entitles Appellants to reopen prosecution, Appellants chooses to address the new ground of rejection herein and move forward with the appeal. Appellants maintain that *Elwalid* fails to disclose the feature in claim 1. First, claim 1 recites "**an** associated output buffer" and the feature "wherein a size of the leaky bucket is less than or equal to a size of **the** associated output buffer." The Examiner now relies on the combination of two buffers relating to B_T and B_{TS}, respectively. The parameter B_{DS} refers to a

data buffer, while the parameter B_{TS} refers to a token buffer. *Elwalid* teaches that the traffic shaping system uses the data buffer at the ingress of the network node to selectively buffer classes of data cells. (*Elwalid*, Abstract). *Elwalid* further teaches that the token buffer 30 can be implemented as a counter which is clocked at rate r as provided by processing circuitry 36 of the network node 14. (*Elwalid*, col. 5, lines 6-8). The counter is incremented at the rate r and decremented when a token is used to output a data packet from the DLBR 16. Appellants respectfully maintain that *Elwalid* fails to disclose the feature "wherein a size of the leaky bucket is less than or equal to a size of the associated output buffer" as the token buffer does not appear to relate to the "associated output buffer" defined in claim 1 – "a leaky bucket having an initial maximum number of tokens which decreases as packets are received in an associated output buffer at a reception token rate for transmission." Appellants respectfully maintain that the rejection should be overturned.

Turning to claims 16 and 24, claim 16 recites "wherein the token availability threshold levels correspond to predetermined egress rate control responses to bandwidth utilization with respect to packet traffic classes," and claim 24 recites "wherein the token availability threshold levels correspond to predetermined ingress rate control responses to bandwidth utilization with respect to packet traffic classes." In the Examiner's answer, the Examiner continues to equate the features above in both claims 16 and 24 with "*determining whether 'average usage of a class to which a flow belongs' is equal to, less than, or greater than a minimum/maximum threshold. [Figs. 1-2]*" as taught by *Lee*. (Examiner's Answer, page 29). The Examiner further refers to the accepting or discarding of incoming information elements depicted in FIGS. 34-41. Claim 16 recites "token availability threshold levels" in addition to

"predetermined egress rate control responses." Appellants respectfully submit that these elements are not taught by *Lee*.

The token availability threshold levels are used in the context of leaky bucket tracking packet transmissions ("when a current token availability level of a leaky bucket tracking packets is between two token availability threshold levels of a plurality of token availability threshold levels"). Even assuming, for the sake of argument, that the minimum and maximum thresholds cited in the Office Action correspond with the token availability threshold levels in claim 16, for example, *Lee* fails to disclose or suggest token availability threshold levels corresponding to predetermined egress rate control responses to bandwidth utilization. In FIG. 34, the compare unit 966 compares the average "information segment storage unit" occupancy of a particular class using the average occupancy counter for that class with the maximum number of occupied "information segment storage unit" rows and the minimum number of occupied "information segment storage unit" rows for that class. Based on this, the multiplexer 964 selects as its output a particular one of the inputs (*e.g.*, "always discard"). Appellants submit that is not equivalent to the predetermined egress rate control responses defined in claim 16. For similar reasons, claim 24 is also believed to be patentable.

Appellants further note that in the Response to Arguments section of the Examiner's Answer, the Examiner now refers to Appellants' admitted prior art in supporting the rejection of claim 16. As this basis was not previously raised in the Office Action mailed April 14, 2009, Appellants respectfully submits that this amounts to a new ground of rejection. Notwithstanding, Appellants disagree with the Examiner's contention that the feature in claim 16 emphasized above is well

known, as evidenced by the background section of the present application. Paragraph [0016] of the present application states "[e]ach time an incoming packet is received by the leaky bucket component, the number of available tokens is compared to two predetermined threshold values." Appellants respectfully submit that the comparison of the number of available tokens to two predetermined threshold values is not equivalent to the feature "wherein the token availability threshold levels *correspond* to predetermined egress rate control responses to bandwidth utilization with respect to packet traffic classes." In view of the foregoing, Appellants respectfully maintain that the rejection of these claims should be overturned.

Turning to the Examiner's remarks regarding claim 9, the Examiner asserts on page 28 that "*[w]ith regards to independent claim 9 . . . Applicant . . . remarks that Elwalid fails to address the deficiencies previously expressed for claim 1.*" (Examiner's Answer, page 28). Appellants respectfully disagree with the Examiner's assertion and notes that Appellants' remarks in the Appeal Brief were directed to the rejection of claim 9 based on the combination of *Carter, Pate, Gracon*, and *Lee*. The Examiner address claim 9 again on page 32 and continues to refer to the registers and to the "drop probability" disclosed by *Lee* in FIG. 37 and to col. 56, lines 22-55, among other text passages. *Lee* teaches of a drop probability used in determining whether to discard a packet and further teaches that the information element is discarded based on a drop probability and that the drop probability is calculated according to the equation: drop probability=((average 'information segment storage unit' occupancy-minimum number of occupied

'information segment storage unit' rows)/G)*(I)." (Col. 56, lines 43-47). *Lee*, however, fails to disclose or suggest the registers (211) specifying a probability with which packets of a specific traffic class are to be dropped when a current token availability level is within a token availability region. FIG. 2 shows the processing and context switching occurring in a prior art RISC processor performing networking functions. *Lee* teaches that processes (205) and (207) depicted in FIG. 2 use a common set of registers (211) to store information specific to that process. Nowhere does *Lee* appear to teach that the registers (211) are related to the drop probability described later in the disclosure.

On page 33 of the Examiner's Answer, the Examiner refers to the instruction & state registers 226a-c depicted in FIG. 4 of *Lee*. FIG. 4 of *Lee* shows the processing in an embodiment of the network processor utilizing three MISD processors 220a-c according to the invention disclosed by *Lee*. *Lee* teaches that the arrival of the information element at the MISD Processors 220a-c triggers instruction and state fetches from memory (e.g., instruction and state fetches from instruction & state registers 226a-c). (*Lee*, col. 9, lines 51-55). Appellants respectfully submit that the Examiner has not explained why one skilled in the art would understand these registers as being characterizing maximum/minimum thresholds. In view of the foregoing, Appellants respectfully maintain that the rejection should be overturned.

CONCLUSION

For at least the reasons discussed in this Reply Brief and in the previously submitted Appeal Brief, Appellants respectfully request that the Examiner's rejection of the claims on appeal be overturned by the Board.

Respectfully submitted,

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